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PLANETARY PHENOMENA FOR MAY AND JUNE, 1913.

BY MALCOLM McNEILL.

PHASES OF THE MOON, PACIFIC TIME.

New Moon ... May 6, 12 ^h 24 ^m A.M.	New Moon ... June 4, 11 ^h 57 ^m A.M.
First Quarter.. " 13, 3 45 A.M.	First Quarter.. " 11, 8 37 A.M.
Full Moon ... " 19, 11 18 P.M.	Full Moon ... " 18, 9 54 A.M.
Last Quarter.. " 27, 4 4 P.M.	Last Quarter.. " 26, 9 41 A.M.

The Sun reaches the summer solstice and summer begins on June 21st, about 5 P. M., Pacific time.

Mercury at the beginning of June is a morning star, rising rather less than an hour before sunrise. It is more than 20° east of the Sun, but it is also 12° south of that body, and consequently does not rise early enough for naked-eye visibility. It passed greatest west elongation on April 24th, and on June 1st it reaches superior conjunction, becoming an evening star. Its distance from the Sun increases rapidly, and before the middle of the month it remains above the horizon an hour or more after sunset. This interval increases to a little more than an hour and one-half by the end of the month, and the planet will reach its greatest east elongation early in July. It may be seen during the latter half of June on any clear evening low down in the western sky shortly after sunset very nearly in the position occupied by the Sun an hour and a half earlier.

Venus passed inferior conjunction with the Sun and became a morning star on April 24th. Its motion away from the Sun is quite rapid, and by May 1st it rises about three-quarters of an hour before sunrise. The superior brightness of *Venus* permits it to be visible to the naked eye in this position, although probably no other planet could be seen in a similar position with respect to the Sun and the horizon. The telescopic appearance of *Venus* is now very beautiful, that of a new moon only a few days old. This same appearance was presented a few days before the time of inferior conjunction. By the end of May the planet will rise nearly two hours before sunrise

and somewhat more than two hours at the end of June. This interval is not nearly as great as the corresponding interval between the setting of the Sun and that of the planet while the planet was an evening star before conjunction, as *Venus* is now in a part of its orbit considerably south of the Sun. *Venus* reaches its greatest actual distance from the Sun and is in aphelion on June 24th.

Mars rises shortly after 3 A. M. on May 1st and shortly after 1 A. M. on June 30th. During this two months' period it moves about 32° eastward and 12° northward through the constellation *Pisces*, passing about $1^{\circ} 20'$ south of the vernal equinox on May 7th. It passes its perihelion on May 18th. Its brightness on May 1st is about 15 per cent of its brightness at the next opposition in January, 1914, and this number increases to about 20 per cent by the end of June, its actual distance diminishing from 175 to 151 millions of miles. Its brightness at this time is greater than it is ordinarily when the planet is at its present apparent distance from the Sun, as it is twenty or more millions of miles nearer the Earth than it would be if aphelion passage came during May instead of perihelion.

Jupiter is moving around to a good position for evening observation, rising at about midnight on May 1st and before 8 P. M. on June 30th. It is in the constellation *Sagittarius* and up to May 7th moves a little eastward. It then begins its westward or retrograde motion, and by the end of June has moved not quite 5° . It will then be about 5° north of the easternmost star of "the Milk Dipper."

Saturn sets before 9 P. M., less than two hours after sunset, on June 1st, and its distance from the Sun diminishes rapidly, so that by the middle of the month it sets less than an hour after sunset and is therefore practically beyond the limit of naked-eye visibility. It passes conjunction with the Sun and becomes a morning star on May 29th. At the end of June it will rise shortly before 3 A. M., less than two hours before sunrise.

Uranus on May 1st rises at about 1 A. M. and on June 30th at about 9 P. M. It is therefore moving around toward a condition for naked-eye visibility. On account of its faintness (it is

less than a sixth-magnitude star in brightness) it can scarcely be seen at a height of less than 15° above the horizon. During May it is nearly stationary and by the end of June has moved a little less than 1° westward. It is in the constellation *Capricorn* and not near any bright star. It is about 1° east and a little south of the fifth-magnitude star ν *Capricorni*.

Neptune is still in the western evening sky, setting at about midnight on May 1st and shortly after 8 P. M. on June 30th. It moves about 2° eastward in *Gemini* during the two months. On June 24th it is in conjunction with *Mercury*, the latter planet being about 2° to the north.